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ABSTRACT

Based on a survey covering 56 countries, this report lists internationally relevant instructional materials and research aimed at familiarizing school children with information concepts and skills, and also discusses the creation of new instructional materials in this area. The study's aims, methods, and rationale are briefly described, as well as the skills involved in information handling at a child's level. The partially annotated bibliography which is provided contains 98 items--mostly of European origin--on children's information concepts, and their reading, studying, and library skills. Bibliographies and literature reviews, reports of current research, background reading for teachers, and descriptions of teaching methods and materials are among the items included. Guidelines are also presented for the creation of two new packages of instructional material: teachers programs designed to aid in the creation of student material at the local level; and student programs covering information concepts, skills, and sources. Slides and films, overhead transparencies, and graphic and textual printed materials are noted as three appropriate formats for student programs. A list of the countries and territories contacted for this study is appended. (Author/ESR)

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INSTRUCTIONAL MATERIALS FOR DEVELOPING INFORMATION CONCEPTS AND INFORMATION-HANDLING SKILLS IN SCHOOLCHILDREN: AN INTERNATIONAL STUDY

Edited by
Ann Irving

General Information Programme and UNISIST
United Nations Educational,
Scientific and Cultural Organization

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A B S T R A C T

The study surveys and lists existing instructional materials and research aimed at familiarizing school children with information concepts and skills, identifies those areas where the creation of instructional materials is possible, and suggests guidelines for their production. Two target audiences for materials are proposed: teachers and students. Suggestions on contents, methods and formats (media) are made, and the study report is aimed primarily at librarians, teachers and those who are concerned with their initial or in-service education and training.

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FOREWORD

This report represents the work of four people who were asked to carry o an investigation into the existence of instructional materials designed to familiarize schoolchildren with information concepts and skills. The group was also requested to identify gaps and propose guidelines for creating internationally relevant materials.

In the short time available the group tried to take a global view of present provision but there will undoubtedly be activities which were not discovered by the group during its working period. The need for international relevance was clearly stated and was a primary consideration throughout the project. The resulting bibliography is therefore small, but contains details of material which would be used in countries other than those from which they originated.

The study was made at the request of the International Federation of Library Associations and Institutions, Section on School Libraries, and was funded by Unesco. Each member of the group had previous experience in this field. Ann Irving, the co-ordinator, has researched into the teaching of information skills to school children in the UK for the British Library Research and Development Department; Tamar Bermann (Norway), has researched into project work research methodology and library user education as part of a longer programme of work at Roskilde University Centre; Ellen Koch Knudsen, (Norway), is an experienced library science lecturer who has specialised in children's and school library services; and Adetowun Ogunsheye, (Nigeria), has, in addition to leading a university department of library and information studies, designed, developed and monitored a syllabus for teaching information-handling skills to primary school children.

The group wishes to extend its thanks to IFLA and Unesco for enabling work to be undertaken, and to the IFLA Section on School Libraries for initiating the proposal and extending invitations to the group members.

The views expressed in this document are not necessarily those of Unesco.

November 1981

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1. INTRODUCTION

"Information has become the essential basis for the progress of human civilization and society" [1]

1.1 The Intergovernmental Conference on the Planning of National Documentation, Library and Archives Infrastructures held in Paris in 1974 provided a framework for Unesco Member States to exchange views and experience on the co-ordinated planning of information policies, methods and services. Among the objectives for Unesco action resulting from the Conference were two which illuminate the background to the feasibility study described in this report:

"Objective 1 - a national information policy

A national information policy, reflecting the needs of all sectors of the community, and of the national community as a whole, should be formulated to guide the establishment of a national information plan, whose elements should be fully incorporated in the national development plans". [2]

Information awareness at all levels is considered essential: the personal, vocational and social development of the individual depends upon the amount, quality and accessibility of information. Not only is information the medium of social communication but it is also a national resource vital for scientific and economic progress.

Objective 2 concerned the stimulation of the information user's awareness:

"In order to increase user awareness, appropriate bodies, including universities and other educational institutions should include in their programmes systematic instruction in the use of the information resources available in all the elements of NATIS." [3]

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1 NATIS National Information Systems: objectives for national and international action. Paris, Unesco, 1975 (com-74/NATIS/3 Rev.)

2 ibid page 10

3 ibid page 11

The Conference felt that every citizen should be aware of his right to the information he seeks - and of its importance - whether it be for professional advancement, performance of his social duties, or recreational reading. If seeking information is to be a normal part of everyday life, the training of information users must begin at school, from the primary level. It is at this stage that the individual most easily learns to use books, libraries and other information resources, and acquires 'functional literacy'. Many countries are now planning and developing school libraries, and seeking help in developing programmes and methods for helping school children acquire life-long information-handling skills.

1.2 Unesco began to support work in this area in co-operation with the International Federation of Library Associations and Institutions (IFLA) soon after the Conference. Two major projects have been completed[4,5] and this feasibility study is the third. It was planned as a contribution to the General Information Programme[6], Part II.A Chapter 5, Objective 10.1 (Information systems and services) Theme 10.1/05: Promotion of the training and education of specialists in and users of information, paragraphs 5122 (Improvement in the accessibility and proper use of information resources by users) and 5132 (Promotion of

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4 Guidelines for the planning and Organisation of School Library Resource Centres. IFLA/Unesco 1980

5 Seminar on the education and training of School librarians. Columbia 1978. Proceedings edited by Sigrun Hannesdottir. IFLA/Unesco 1980

6 Joint Unesco/Commission of the European Communities, Committee on Scientific and Technological Information. Draft programme and budget for 1979-1980. Paris, Unesco 1978. (PGI/CEC/III/3)

information users' education in Member States). One of the stated aims of Unesco is to contribute to the establishment of the new international economic order, improving the quality of life of each individual through cultural development, which is an essential element in the fight against social injustice and the lack of equal opportunities.[7] Access to information is an inseparable part of this development but it depends not only upon the provision of information but also upon the individual's knowledge of, and skills for, selecting, obtaining and using it.

1.3 This study recognizes the differences in provision for information resources among nations, particularly the discrepancies in provision for young people, and it concentrates less on the usage of resources gathered and co-ordinated in school libraries, rather more on the skills required for the usage of general information by school children, irrespective of library provision.

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7 NATIS National Information Systems: objectives for national and international action. Paris, Unesco, 1975 (com-74/NATIS/3 Rev.) page 30.

2. AIMS, METHODS AND RATIONALE

2.1 The study had three main aims:

(i) to identify and evaluate existing instructional materials and research activities aimed at familiarizing school children with the concept of general information and in developing their capabilities to handle information

(ii) to identify those areas where the creation of such instructional materials were possible

(iii) to produce guidelines for their production

Concentration was on materials and programmes in schools which might be internationally relevant and designed to develop the multiple skills necessary for the effective usage of information. The procedures for using libraries were considered, but it was recognised that school and public libraries in many countries were under developed, or non-existent. Some have very small collections of material, they may be badly organised and/or not open for many hours, and they may contain material which is out dated or poor in quality of content. The rural nature of many countries makes access to a library difficult or impossible and yet the need to seek out and use information is not diminished. A farmer must discover how to protect and nurture his crops with or without the aid of printed information and his wife must learn basic health care in order to maintain her family's fitness and stability.

2.2 It was agreed that librarians, teachers and their trainers were the main audiences, especially those working in developing countries where information and materials on the topic are relatively scarce. The document can be used as a rationale and framework for thinking about teaching programmes for school children which incorporate the concepts and skills relating to 'information' as a resource.

2.3 The international nature of the work and the constraints which resulted required concentration on materials which related to the wider concept of information and its handling rather than on the narrower materials related to the use of documentation centres, archives and libraries. School children have a more limited independence than adults when seeking information in such institutions, but they are more open to strategies for raising awareness of the need for information-handling, and perhaps more flexible in terms of changing attitudes and behaviour. The requisite thinking skills which are the foundation for the effective usage of information are prerequisites for the searching process commonly identified in libraries and documentation centres have been emphasised. One of the problems for mature users of information resources is that training often assumes a thinking strategy which is rarely well-developed in users. Many programmes at a higher educational level than schools are described (by those who initiate them) as less effective than desirable; students fail to remember how to conduct literature searches or have difficulty in using literature guides e.g. abstracts and indexes. Or they fail to understand how to use library catalogues and classification schemes effectively.

It was felt that these difficulties resulted from the lack of conceptual awareness about the range and nature of information, how to establish and define information need, and how to realise the purpose and utility of information before and after the search process.

2.4 Several additional factors affected the work. The 'information explosion' has made the teaching of many subjects difficult and confusing : the store of knowledge from which the teacher develops his curriculum has grown at an alarming rate and continues to grow unabated. The rapid and sophisticated developments in world communications technology increase an individual nation's information resources, making control and selection more complex for the individual citizen; computer technology is beginning to revolutionize industry, document recording, availability and transfer. All of these developments seem to condition future planning for training information users and are particularly important for planning work with school children whose adult life will be lived in a very different world from the present one. Indeed, if children are trained in the skills for handling information, they may be able to shape that world for themselves and participate in the decision-making processes that will determine its future.

2.5 Children learn to assimilate and utilise information long before they attend school. They learn to speak and to walk, and how to behave within their social groups of family and friends. None of this learning depends upon "instruction" as practised in school. Most of it emananates from observation and emulation, aided by the correction and specific examples set by adults. At this level of learning, motivation is very strong; the child wishes to take part in group activities, wishes to have, and therefore needs to be able to ask for, and wishes to reach objects or people he sees, thus struggling to master the techniques of walking and balance. Later, he learns what not to eat or touch because of warnings from adults around him, and he acquires other knowledge and skills from watching how adults react and behave; for example, staying dry when it rains and keeping warm when it is cold. A great deal of learning takes place in a relatively unplanned way before the child enters formal educational systems.

2.6 The child therefore brings to school a body of existing knowledge and a degree of skill for its acquisition. The constants have been a continuous confrontation with the learning resources (the weather, the family etc.) and constant practice and reinforcement of the developing skills

(needing food or shelter, approval or modification of behaviour by adults), together with a clear perception of need leading to strong motivation for satisfaction and reward (e.g. feeling hungry, wanting food, obtaining through asking or finding it, and eating to remove the hunger). He is, therefore, already developing the skills for handling information.

2.7 School tends to intervene in this natural process of learning. In the classroom the child who has perceived needs, discovered information and applied it must acquire knowledge for which he cannot perceive need (although his teachers can) and which he cannot apply immediately to his life (because adults believe that children must acquire knowledge which will be useful in the future). What he learns at school he may not "need" and for many children the only continuation of the learning process takes place outside school walls, at home, where relevance for learning is daily apparent : children who are poor learners at school still learn about their hobbies or about domestic activities. Although children <u>do</u> acquire knowledge at

school (some acquire a great deal of knowledge and continue into higher education) they forget how to learn, how to handle information, because many schools make the decisions about what should be learned and may fail to relate the skills for learning school subjects to the child's activities outside the school. By the time the child completes compulsory schooling he may be ill-equipped for handling information related to non-academic activities, and perhaps not particularly skilled at handling unfamiliar learning topics which are academic. At college or university, he still expects to be told what to learn and remains, for a long time, unable to transfer the skills for learning to all areas of human activity.

2.8 The skills for handling information must be illuminated before they can be taught or developed. The problem in many schools is that such skills are assumed by teachers, therefore not specifically practised across the curriculum, nor encouraged outside school. Practising the skills at school and at home would link the child's perceived needs for knowledge with those perceived for him at school. Learning about a subject is less valuable in the long term than learning how to learn about a subject. Knowledge changes and increases but the skills for finding and using information are of life-long value. This study therefore analyses the information concepts and skills before suggesting how they should be acquired by school children.

3. INFORMATION HANDLING SKILLS

3.1 The following outline of information-handling skills has been constructed with the school context in mind. Different schooling systems will affect the acceptance of the outline among teachers but the outline rests upon the assumption that information is a valuable national resource and that information-handling skills are essential to all citizens, irrespective of vocational or social advantages.

Topic definition and defining information need

The child's understanding of the assignment set by his teacher involves understanding the terms related to the topic, as used by the teacher, and the child's capacity to find alternative words or synonyms which will build up into a set of keywords or search terms to be used for seeking information. Existing knowledge of the topic must be assessed and before he decides what additional knowledge is required for the assignment he must identify, or be supplied with, a target audience for his work which will provide a focus for his final presentation and determine its parameters and approach. He must also be given an idea of length, depth, breadth and format of presentation.

Choice of information sources

The child must know what sources of information are available to him, which will include library material, people, places, objects, radio, television, books and journals both at home and in classrooms. Older children

should know about national information resources; libraries, archives, documentation centres, advisory services and personnel. He should be aware of the concept of information, its generation and storage, developing the ability to select those sources which are appropriate to a particular need, and which are the most useful to him.

Search strategy

Searching has two main aspects : where to look and how to look. The second is the most neglected, and involves advanced reading strategies, oral and visual 'literacy', and confidence in the application of these techniques. For example, advanced reading strategies (which are seldom taught) include scanning a page for facts, skim-reading for meaning, reviewing what has been read for understanding. Knowing what should be noted for reference later is important, as is the ability to alphabetise to several letters for skilful use of book indexes. The organisation of books and libraries should be comprehended so that the clues for their use can be followed e.g. contents lists, indexes, chapter headings, catalogues and subject arrangements. Understanding the organisation of recorded knowledge is important for the child, who can then apply the classificatory techniques to other forms of activity, and thus make order out of chaos and sense out of nonsense.

Evaluation of information

This is the most difficult part of information-handling for people of all ages. It involves an appraisal of information sources and an assessment of their validity - which source

is correct and whether or not the information is valuable. It also includes the child's subjective judgement - what he thinks about the information, possibly the most crucial element in the process of handling information because it conditions the application and use of any new knowledge.

Organising note-making

In order to complete a learning assignment children must be capable of making notes which can be used for reference during the final stages of presenting the completed work, for example, as an essay. When the teacher dictates notes, children do not learn how to recognise important points from books or other resources - the teacher has already done this. The child must review the topic definition, the purpose of the assignment and its target audience in order to make sense out of the note-making. Good notes can only develop from the child's clear understanding of what needs to be discovered and why.

Presentation

The child must re-organise his notes on the information gathered into an order which, to him, allows expression in a particular sequence, using appropriate language, illustrations, graphs, diagrams, etc. as required. Bringing together all his existing knowledge and new information is half of the task; the other half consists of its application to the task - the answer to a question set by the teacher - in a manner (form of presentation) which is entirely appropriate in terms of level, content and structure.

3.2 The emphasis throughout the outline is on information research skills rather than those solely related to using school libraries, because children do not easily transfer skills associated with one curricular area to others. Research skills, the skills for finding out by study or investigation, are primarly thinking or cognitive skills. The successful investigator is able to engage in a process of thinking, and it is the process which must be encouraged at an early stage of a child's schooling so that it develops over time into a refined and sophisticated ability to solve problems throughout life. It is the embryo of this process which is present in the young, pre-school child (hunger → food → search → satisfaction), and which should be nurtured throughout school rather than supressed by rote learning and dictated information. Above all, in order to be learned (in contrast to being taught) children must be given relevant assignments and time for practice.

3.3 But there is no magic formula to accomplish this ability. Pupils learn at different speeds and in different ways, just as teachers use different methods and approaches to initiate and expedite learning. Pupils will acquire information-handling skills if their learning is relevant to assignments or interests which appear to them to have practical application. One of the problems of many existing and previous attempts to teach pupils how to gather and use information is that proven educational/ psychological theory has been ignored, and there have

been innumerable examples of courses on information and libraries which teachers and librarians have attempted to integrate into existing school curricula. What should happen is that existing curricula should be examined in order to discern the relevant information skills which are inherent in each subject so that they can be specifically indentified by teachers, taught within their subjects and practised frequently through assignments which the teacher has set with a clear knowledge of the skills involved in mind.

3.4 During recent years, the introduction of computerised information retrieval has led to a greater emphasis on elementary and fundamental cognitive skills on the part of the user. Increasingly, information workers are studying the philosophical, social, psychological and pedagogical aspects of these skills. To many teachers it might seem ironical that information workers now - after the near perfection of hardware - are concentrating on what teachers have been working on all along, namely the development of cognitive skills. Previously, librarians and other information workers concentrated their attention almost exclusively on the storage and organisation of documents: library-user education consisted largely of making the users think along the lines of library classification. The central activity in all information searching is concept formation. This includes examining relationships between concepts and the activities, objects, etc. which they denote, clarifying relationships between concepts, as well as between

concepts and their symbolic representations. Many of the most appropriate methods central to teaching and learning information-handling skills will strike teachers as familiar, as they are already used in schools. However, such skills are most often practised independently of each other, as "word association","alphabetization", "elementary set theory" etc. Furthermore, they are not usually correlated with the general concept of information or the skills necessary for defining information needs and devising search strategies.

3.5 Once the aim of teaching information-handling skills is established as enabling youngsters and adults to find information necessary for living in an increasingly complex world beyond the confines of classrooms and libraries, the whole world around them becomes a potential source of information. Therefore, the central activity in any information search is the

- delimitation of the topic, query or problem and the
- clarification of the need for information (see skills listed in 3.1)

Topic definition, formulation of a problem and definition of information needs respectively, are not merely preliminary stages for information search. Although necessarily occuring at the starting point, these activities are repeated throughout the search process; topic and information need will - consciously or unconsciously - be defined and re-defined in the light of information found.

3.6 When learning many skills, whether conceptual or manual, a period of verbalization of skills and steps is useful to the learner until activities have become "automatic" and knowledge has become "tacit". At school, delimitation of topic and clarification of information needs ought to occur together and ought to give the children an opportunity to use their previous experiences in defining the aspects of a topic on which they are to work.

The individual skills which profitably can be practised in connection with the definition of the topic and information needs will be useful or even indispensable at later stages, as they are basic cognitive skills, many of which are inseparable from knowledge about the world in general and subject knowledge in particular. Essentially, the general concept of information can best be introduced when it is directly related to topic definition and definition of information need rather than when it is immediately tied to information sources in the form of libraries or documentation centres. The development of abilities and skills in thinking should be thought of as the ultimate goal of the total school programme and not as the outcome of special subjects or projects. The development of concepts, and their use in the solution of problems, appears to be highly dependent upon pupils' ability to verbalize their experiences, and one of the most important tasks facing the teacher is to encourage the development of verbal ability so that pupils may learn to recognise

present and potential information-handling patterns of behaviour.

3.7 Typically, instruction in gathering and using information has been ordered according to logical analysis of library organization. If all libraries used an identical system (and indeed, if all people had access to a library) there might be an argument for teaching it - but this is not the case. The active processing of information and the organisation of concepts and mental schema are, however, essential to the development of intelligence and intellectual productivity, as has been shown by studies of cognition and mental functioning.

There are clear implications for teacher education. During training, student teachers could be given typical school assignments, normally set for pupils, and be required to complete them in the manner expected of pupils. Discussion should illuminate problems and solutions, and should illuminate the cognitive and manual skills which are inherent in the assignments. Experience is most valuable and leads to understanding. It also leads to the application of knowledge and skills thus gained, and the natural teaching and reinforcement throughout the schooling period and across the school curriculum. Teacher education must include some training for teaching information concepts and handling so that children grow up aware of their own potential to control the information which surrounds and affects them.

4. INSTRUCTIONAL MATERIALS

4.1 This study aimed to identify and evaluate existing school materials and research activities which are internationally relevant. The net was widely cast and many educational personnel were contacted throughout the world, but the results were disappointing. Very few materials were fully described by those who replied and only a small proportion were considered internationally relevant. The bulk of identified materials are produced in the United States of America, the United Kingdom, Australia, Scandinavia and Canada. Other nations were identified as producers of potentially useful material, but clearly, the major impetus for work of this kind comes from highly industrialised, English-speaking countries. A paradox exists, however, which is that the nations most advanced in their planning of national information policies and structures are those currently described as 'developing, countries. Where there has been a wealth of information and documentary provision, the skills for handling them have been discussed relatively late in the history of that provision. In developing countries, where provision is handicapped by a paucity in finance, a lack of indigenous publications, limited educational provision and a generally slow economic growth, in such countries there has been much greater public awareness of the need for information planning, personel and pedagogy.

However, nowhere was there a substantial amount of material, research or experience which centered upon the general concept of information nor the skills for its manipulation. The bibliography therefore includes entries for materials which, in their present format, are not essentially internationally relevant - but with modification they might prove useful in many countries.

Apart from countries with rich and plentiful documentary resources and centres, information skills instructional materials are rarely provided for young people. The need for teaching school children of the value and use of information has been expressed for many years, but the development of programmes and materials has been relatively recent. The developing technologies of reprography and audiovisual equipment have helped : they have facilitated the production of worksheets, for example, and enabled instructors to reach much larger groups of learners. Indeed, the large numbers of new students in many institutions of higher education has been a major impetus to the development of more sophisticated methods.

4.2 The materials listed in the bibliography which follows are arranged, where possible, in order of the particular aspects of information handling they cover. It was not always possible to assign an item to one particular category : multi-purpose items are gathered together in the general section or there are cross references where this seems more helpful. Annotations have been included where possible but not all the items listed have been

examined. It is a very selective bibliography. Rather than list every item which may be considered useful, bibliographies and literature reviews have been included, followed by items particularly valuable for teachers as background reading, details of research, materials, and items which deal specifically with concepts of information.

Many of the items are therefore from European countries, mainly because of a lack of material published elsewhere covering information concepts and skills.

The bibliography is divided into the following sections:

Bibliographies and Reviews	items 1 - 12
Information Concepts and Skills	items 13 - 26
Current Research	items 27 - 30
Background Reading and Teachers	items 31 - 46
Methods and Materials	items 47 - 98

BIBLIOGRAPHIES AND REVIEWS

1. ADAMS, D.W. (1975) Literature review of the needs of different sectors and disciplines for instruction in information use. British Library Research and Development Department, 1975. (Report number 5221). BRITAIN

   One of the early surveys of the needs for information instruction, covering many different age levels and groups. Ministers would find it useful for its recommendations for surveys and bibliographies on instruction for schools, researchers, professionals and public library users. It suggests that there should be conferences, published case studies and sets of standards for instructional programmes.

2. HEER, Lynn and others (1977) Bibliography from "have you tried the card catalog .... and other neat things" : Library Skills Fair, 1977. Held in the State Library of Ohio. UNITED STATES OF AMERICA

   Print and non-print resources for teaching library skills and study skills. Also includes a number of articles on the topic and some curriculum guides for teachers and librarians.

3. Instructional materials for teaching the use of the library. Claremont House, 4th edition, 1971. (Also updated in Booklist, volumes 68, pages 808-814 and 71, pages 1001-1003). UNITED STATES OF AMERICA

4. IRVING, Ann and SNAPE, W.H. (1979) Educating library users in secondary schools. British Library Research and Development Department, 1979. (Report number 5467). BRITAIN

   Reports a survey undertaken in British secondary schools on library-user education programmes. An outline model programme is proposed which begins with the concepts of information and leads on to defining search strategies, the concept of authorship, using books and information, note-making and presentation. Includes an annotated bibliography of related books and articles and an annotated listing of current research.

5. LOCKWOOD, Deborah L. compiler (1979) Library instruction : a bibliography. Greenwood Press, 1979. UNITED STATES OF AMERICA

   Covers 934 items in English dealing with most aspects of library instruction. There is a section on schools and several sections devoted to teaching methods and formats.

6. LUBANS, John. Editor (1974) Educating the library user. R.R. Bowker Company, 1974. UNITED STATES OF AMERICA

   A significant collection of papers on many aspects of this topic from the elementary school through to universities. Teacher involvement and evaluation procedures are also included.

7. LUBANS, J. Editor (1978) Progress in educating the library user. R.R. Bowker Company, 1978. UNITED STATES OF AMERICA

A series of articles covering recent thinking and activities on a range of themes. School Library instruction is covered for Britain, The United States, Canada, and Scandinavia.

8. MALLEY, Ian Compiler (1980 -) Education in the use of libraries and information - a bibliography. Loughborough University of Technology, 1980 - BRITAIN

This forthcoming publication is in four parts covering the periods, pre 1900 to 1954, 1955-1969, 1970-1975 and 1976-1979. There are no annotations but since the coverage is based upon the extensive collection of items gathered by the compiler, Information Officer for User Education (funded by the British Library Research and Development Department) it is possibly the most comprehensive listing ever produced. The items are arranged alphabetically, by author, and there is an index to subjects.

9. RADDON, Rosemary Compiler (1979) Annotated bibliography on educational resource organization and related topics. Council for Educational Technology, 1979. BRITAIN

Useful guide to readings on the topic, including some case-study material. Particularly helpful for references on organising material and instructional programmes for school libraries.

10. SMITH, J.M. and WINKWORTH, F.V. (1978) Library user education: a bibliography of teaching materials for schools and colleges of further education. British Library Research and Development Department, 1978 (Report number 5436). BRITAIN

A list of commercially produced book and non-book items published since 1965. All the items were intended for school children or students in tertiary institutions.

11. TAYLOR, Peter J., HARRIS, Colin, CLARK, Daphne. (1979) The education of users of library and information services : an international bibliography, 1926-1976. Aslib, 1979. BRITAIN

Contains unannotated references to books and articles in chronological order, with an author index. Part one lists 20 other bibliographies on the topic.

12. WINKWORTH, F. V. (1977) User education in schools: a survey of the literature on education for library and information use in schools. British Library Research and Development Department, 1977. (Report number 5391). BRITAIN

A literature review and bibliography of British and American materials published during the past 15 years. A very useful review of major thinking on the topic under the headings of skills, methods, materials and evaluation. The bibliography is annotated, the country of origin noted and the school level of pupil each item concerns is indicated.

INFORMATION CONCEPTS AND SKILLS

13. BATES, Marcia J. (1979) Idea tactics. Journal of the American Society for Information Science, September 1979, 280-289. UNITED STATES OF AMERICA

Description of psychological tactics intended to help the thinking and creative processes in searching, leading to improvement. This and the following article make useful points for teachers to consider.

14. BATES, Marcia J. (1979). Information search tactics. Journal of the American Society for Information Science, July 1979, 205-214. UNITED STATES OF AMERICA

Introduction to the concept of information search and tactics of which 29 are defined and analysed. Emphasis is on the human, psychological processes involved in searching and on the importance of articulating the tactics by the searcher to help him in their application.

15. BERMANN, Tamar et. al. Editors (1979) Library user instruction and the teaching of research methodology: report on a seminar held at Roskilde University Centre, 1976. Roskilde Universitetscenter, 1979. DENMARK

A very valuable collection of papers and group reports covering roles and models for researching in libraries, barriers and problems encountered by users and communication between users and librarians. The first paper concerns the way in which librarians and teachers keep their own search procedures private, rather than sharing them with users.

16. BERMANN, Tamar et. al. (1977) Library user instruction in the framework of project studies : teaching humanities students literature search during the basic studies programme at Roskilde University Centre. Instit for sprogbrugs - Socialisations - og Videnskabs - Forsk ning, Roskilde Universitet scenter, 1977. DENMARK

Describes a course for students in literature search and library use - an invaluable case study.

17. BRAKE, Terence (1980) The need to know : teaching the importance of information. British Library Research and Development Department, 1980 (Report number 5511). BRITAIN

Describes the rationale for, and implementation of a secondary school course designed to teach information-handling skills. Each element of the course is described, together with its preparation and problems. There are details of pupils' and teachers' responses and examples of course materials. Includes a bibliography. The materials deal with the concept of information and how it could be taught in an enterprising and effective way.

18. BRITTAIN, J.M. (1973) Instruction of students in the handling of information. Nato Information Science Advanced Studies Institute, College of Librarianship, Wales, 1973 BRITAIN

One of the most useful papers on information-handling, drawing a clear distinction between traditional library instruction and the concepts of information-handling. A useful document for ministers and teacher educators

19. DEAN, Joan The literacy schedule. University of Reading, School of Education, Centre for the Teaching of Reading. BRITAIN

Aimed at teachers to help them ensure that children acquire the skills of literacy for adult life, for study and for social situations - for school children aged 9 and upwards.

20. DE BONO, Edward (1979) Teaching Thinking . Maurice Temple Smith Ltd., 1976. BRITAIN

A very useful book on thinking as a skill and how it can be taught to school children, based on work done with children in schools in many countries through the Cognitive Research Trust. This book would provide an excellent basis for developing programmes to teach information-handling skills.

21. Information skills in the secondary curriculum. (1981) Curriculum Bulletin no. 9, The Schools Council. BRITAIN.

The document is the work of a group convened by the British Library Research and Development Department and the Schools Council. It is a practical document which outlines an information skills curriculum and offers guidelines on its implementation in the secondary school curriculum.

22. INGWERSEN, Peter and KAAE, Søren (1979) User-librarian negotiations and information search procedures in public libraries : analysis of verbal protocols. Copenhagen: Royal School of Librarianship, 1979. DENMARK

An interesting report on research into user-librarian search processes by means of verbal analyses. The technique is useful and generally uncommon but could lead to useful knowledge of actual searching procedures, and subsequently to instructional programmes which relate to actual user behaviour.

23. LEOPOLD, C.C. (1971) School Librarians: are we for real? School Library Journal, April 15, 1971, 26-30. UNITED STATES OF AMERICA

Argues the place of the school library in the teaching of critical thinking skills.

24. NOVAK, Joseph D. (1977) A theory of education. Ithaca: Cornell University Press, 1977 UNITED STATES OF AMERICA

Expands some of David Ausubel's educational theories, particularly those concerning the process of conceptual learning. Could prove valuable when designing exercises and lessons on information handling.

25. PEJTERSEN, Annelise Mark (1979) Investigation of search strategies in fiction based on an analysis of 134 user-librarian conversations. Copenhagen: Royal School of Librarianship, 1979. DENMARK

A theoretical study but unusual and interesting. It could prove useful to librarians or teachers wishing to use fiction as a basis for teaching search strategies.

26. TIMMERMANN, Povl (1979) A cognitive view on the Dewey Decimal Classification. Danmarks Biblioteksskole, 1979 [unpublished] DENMARK

An interesting study of the factors which affected the major library classification scheme, which developed from a study of the mental processes of literature searching.

See also item numbers 27 and 30

CURRENT RESEARCH

27. Information Skills in the Curriculum Research Unit. Inner London Education Authority, Learning Resources Branch, Centre for Learning Resources, 275 Kennington Lane, London SE11 5QZ. BRITAIN

The Unit aims "to create opportunities in the various subject curricula for the introduction, exercise and development of a wide range of information skills" in secondary schools. Teams of teachers have been selected from 10 London schools. Their teaching will be examined to determine existing coverage of information skills and a specially-designed in-service course programme will be developed to help teachers create subject-based teaching materials.

The research director is Mr. Terence Brake, (see also item number 17).

28. LUNZER, E. and GARDNER, K. Reading for learning in the secondary school. School of Education, University of Nottingham. BRITAIN

The research follows earlier work for the Schools Council on the effective use of reading. It aims to develop methods and materials to provide independent learning, based upon reading and study skills.

29. TIMMERMANN, Povl DENMARK

The Royal School of Librarianship is currently researching into several aspects of information skills. Some of the publications are listed under 'Materials and Methods'

30. Using books and libraries project. Centre for Educational Research and Development, University of Lancaster, Director: Dai Hounsell. BRITAIN

The project is funded by The British Library Research and Development Department and aims to disseminate information on teaching the use of books and libraries in secondary schools. The strategy comprises a pamphlet: Information Skills in the secondary school, a teaching resources folder containing ideas and materials which might be used, and a programme of workshops.

BACKGROUND READING FOR TEACHERS

31. AGUOLU, C.C. (1975) The School Library as an instrument of education in Nigeria. International Library Review, 7, 1975, 39-58. NIGERIA

32. ALLEN, T.J. and GERSTBERGER, P.G. (1967) Criteria for selection of an information source. Alfred P. Sloan School of Management, MIT. Working Paper, 1967. UNITED STATES OF AMERICA

Another paper for teacher educators. It argues that the learner's behaviour when making selections from information sources is influenced by the perceptions of ease of use and accessibility - the latter being influenced by previous experience. Important because of the implications for both the organisation of resources and the systems and procedures designed to make them accessible.

33. DEAN, Judy (1978) 16-19 study problems : a report from the sixteen - Plus Education Unit. National Foundation for Educational Research, 1978. (Research in Progress Series) BRITAIN

A useful account of study problems as seen by older school children, with suggestions for the teaching of study skills.

34. DEER, Christine and HALL, Noelene. (1979) Curriculum: intention and reality. Sydney: Northern Districts Education Centre Co-operative Limited, 1979. AUSTRALIA

A document on curriculum development which is aimed primarily at teacher librarians involved in developing library reader education programmes.

35. Information fürden Schulbibliothekar. [Information on school libraries] Frankfurt: Zentrale Beratungsstelle für das Schulbiblioteksswesen in der BRD am Institut für Jugendbuchforschung der Universität Frankfurt am Main. No. 1-6, 1972-74. GERMANY (West)

Of special interest is number 2 which contains interviews with pupils in an upper high school about their feelings on information retrieval skills.

36. KNUDSEN, Ellen Koch (1977) Training the users: school libraries. Paper presented at the Liverpool Polytechnic, Department of Library and Information Studies, 1977. NORWAY

37. LESTER, Ray (1979) Why educate the library user? Aslib Proceedings, 31(8), 1979, 366-380. BRITAIN

A useful article which offers a critical evaluation of some present practice in library user education. The cogent arguments would provide valuable discussion material, particularly amongst librarians and information workers in training.

38. LUNZER, Eric and GARDNER, Keith Editors (1979) The effective use of reading. Heinemann Educational Books, for the Schools Council, 1979. BRITAIN

One of the most useful British research reports on the topic, concentrating on printed texts and the skills for extracting information from them. Sections on project work and reading laboratories are especially helpful.

39. MARLAND, Michael et. al. (1977) Language across the curriculum: the implementation of the Bullock Report in the secondary school. Heinemann Educational Books, 1977 BRITAIN

Contains a number of chapters on reading and its associated skills which would be useful for teachers.

40. Media studies in education. (Reports & Papers on Mass Communication, no. 80). Paris: Unesco, 1977.

Describes media education in schools in Western Europe, Scandinavia, the USSR and the USA. Contains extracts from courses which can be used as models.

41. NAQVI, S.H.R. (1977) Importance of the school library in the new educational pattern. Journal of Indian Education, 2(6), 1977, 54-57. INDIA

42. NOBEL, Agnes (1977) Att lära och att uppleva: mot ett vidgat lä romedelsbegrepp [To learn and to experience : towards an expanded definition of the teaching aids concept] Skolöverstyrelsen, Sektionen för lä romedelsutveckling, 1977. SWEDEN

A report for school heads and teachers on where to find information in schools and outside.

43. ODENSTAM, Gunnel et. al. Lä rare - bibliotekarie i samverkan: rapport från ett utvecklingsarbete inom LBS-projektet. [Teacher-librarian in interaction: report from a developmental project within LBS] Skolöverstyrelsen, Sektionen för lä romedelsutveckling, 1977 SWEDEN

How teachers and librarians together can create attitudes and skills necessary for using school libraries. Has some useful diagrams.

44. POTTS, John (1976) Beyond initial reading. Allen and Unwin, 1976. BRITAIN

Emphasis is on secondary schools and the reading needs and skills required by older school children.

45. SRIVASTAVA, A.P. (1977) Some ways for a better reading in school subjects. Journal of Indian Education, 2(6), 1977. INDIA

46. TANDON, M.M.L. (1958) Library service in school and development of reading habits. Indian Librarian, 13(1), 1958, 6-8. INDIA

METHODS AND MATERIALS

47. Arbeit in Schulbibliotheken. [Work in school libraries] Bern: Kommission für Jugend - und Volksbibliotheken des Kantons, 1974. SWITZERLAND

A good, systematic approach to the teaching of how to use books and other sources of information in school libraries. The examples could be used in many countries.

48. AS, C. van (1974) Omgaan met het documentatiecentrum [how to find information in the elementary school documentation centre] Amsterdam: Versluys, 1974. NETHERLANDS

49. AS, C. van (1976) Van a tot 3 over het alfabet [A 'step-by-step' course in the use of the alphabet] Amsterdam: Versluys, 1976. NETHERLANDS

Designed to teach elementary school pupils the use of the alphabet in catalogues, dictionaries, encylopaedias.

50. ASTÍ VERA, A. (1973) Metodología de la investigación [Investigative methodology] Buenos Aires: Kapelusz, 1973. BRAZIL

51. BELL, Irene W. and WIECKER, Jeanne E. (1979) Basic media skills through games. Libraries Unlimited, 1979. UNITED STATES OF AMERICA.

Describes board and card games which are designed to teach and reinforce basic media skills for young children.

52. BENNETT, Hazel E. Editor (1977) Suggestions for teacher-librarians. Jamaica Library Association, School Library Section, 1977. JAMAICA.

Ideas and suggestions which include some on the teaching of library use and study skills. Intended as a practical guidebook, the suggestions aim to help teachers to organize and make the best use of school libraries.

53. Benützung der Bibliothek [Library use] Bern: Kommission für Jugend - und volksbibliotheken des Kantons, 1976. SWITZERLAND

Contains a good overview of classification ideas and the rreliminary lecture on the use of libraries.

54. BRITISH COUNCIL. Central Information Service. (1980) Audio-Visual materials on librarianship. British Council, 1980. BRITAIN.

Lists a range of audiovisual items dealing with information sources.

55. BROR HJORTFÖRENINGENS GRUPP (1978) Barn på museum London/ Paris: rapport från en resa. [Children visiting museums in London and Paris] Skolöverstyrelsen, 1978. SWEDEN.

Describes how schools can teach children how to collect inforatation from museums.

56. CARMAN, R.A. (1976) Habilidad para estudiar : guía práctica para mejorar el rendimiento escolar. [Studying ability : a practical guide to improve scholarly performance] Mexico: Limusa, 1976. MEXICO.

57. ECHEGARAY de JUÁREZ, E.M. (1974) Enseñando a aprender con estudio dirigido [Teaching to learn using guided study] Buenos Aires: Kapeluez, 1974. BRAZIL.

58. ECHEGARAY de JUÁREZ, E.M. (1971) Estudio dirigido: técnicas del trabajo intelectual [Guided study: techniques of intellectual work] Buenos Aires: Kapelusz, 1971. BRAZIL.

59. EIKLI, Kristin et. al. Et brukeropplaeringsopplegg for 1-6 Kl. [A user instruction programme for children aged 7-12 years] Eksamensoppgave i Fag 22 Pedagogikk, Statensbibliotekskole. NORWAY.

Concentrates on the Norwegian school system, but may be adopted for use elsewhere.

60. GARCÍA LAGUARDIA, J.M. (1976) Guía de técnicas de investiación [Guide to investiative techniques] Guatemala: Serviprensa Centroamericana, 3 ed. 1976. GUATEMALA.

61. GARZA MERCADO, A. (1972) Manual de técnicas de investigación para estudiantes de ciencias sociales. [Manual of investigative techniques for social science students] México: El Colegio de México, 2 ed. 1972. MEXICO.

62. GEEST, A. van der en SWÜSTE, W. (1977) Het gebruik van de schoolmediatheek. [Practical quidelines for the use of the school media centre] Den Bosch: Malmberg, 1977. NETHERLANDS.

63. GIBBS, Graham (1977) Learning to study : a guide to running group sessions. Institute of Educational Technology, Tuition and Counselling Research Group, The Open University, 1977. BRITAIN.

A particularly relevant and valuable manual for teachers and others planning instructional courses. It concentrates on strategies and techniques for study skills instruction, and it is the method for doing this which has made it popular in universities and polytechnics in Britain. The method is readily adapted for use with school children and much of the manual can be photocopied and used without any other materials, nor with extensive provision of resources. Highly recommended.

64. A good read. [videorecording] BBC Television, 1979. BRITAIN.

A series of ten 20 minute programmes designed to help school children cope with the reading encountered in and out of school. Each programme covers aspects of three themes : reading as a thinking skill, study skills, and reading as a source of pleasure. There are teaching notes, exercises, and further readings in an accompanying booklet. Using individual books by means of the contents list, index, illustrations and other clues is well covered, and there are also details on searching for information from other sources. The need for school children to define and focus their enquiries is emphasised.

65. GUTIÉRREZ SÁENZ, R. (1973) Metodología del trabajo intelectual [Methodology of intellectual work] Mexico: Esfinge, 1973 MEXICO.

66. Handleiding cursus documentatiecentrum [Guide to the school documentation centre] Leeuwarden : Centrale Bibliotheekdienst Friesland, 1975. NETHERLANDS

How to find, handle and present information.

67. HART, T.L. Editor (1978) Instruction in school media center use. Chicago : American Library Association, 1978. UNITED STATES OF AMERICA

Contains a number of useful ideas for integrating the teaching of gathering information from library materials with normal classroom teaching. Contains many practical examples and a multi-media bibliography.

68. HILLS, P.J. (1980) Information package on teaching and learning methods for librarians. [kit]. British Library Research and Development Department, 1980 (Report number 5512). BRITAIN

The package contains audio tapes, slides and overhead projector transparencies and is designed to help anyone wishing to teach students how to use the library, especially helpful to librarians. It covers a range of teaching and learning methods which are considered particularly appropriate to user education programmes, and details of evaluation techniques. (Current cost of the package is £40.00).

69. HODGKINSON, A.W. Screen education: teaching a critical approach to cinema and television. Paris: Unesco, 1974. PARIS. (Reports & Papers on Mass Communication No. 42).

Although old, this report is an excellent rationale for developing skills for understanding visual information.

70. How to read a book. [film] (1947) Coronet, 1947. *Film; sound; colour; 10 minutes.* (Basic Study Skills Series) BRITAIN

Although old, the film deals with some important points. It attempts to answer the questions, "What information do we need? What questions do we want answered?" and, "What doesn't the book offer that will contribute to our knowledge and understanding?" Covers the author's attitude, where to look for key ideas, using the index, footnotes and references, when to read quickly or more carefully. Could provide a model for adaptation by individual countries.

71. KALLEN, M.J.P. van der (1973) Alfabet en Woordenboek [Alphabet and dictionary] Tilburg : Zwijsen, 1973. NETHERLANDS

A programmed text on using the alphabet in connection with the dictionary.

72. KUMAR, Krishan (1974) Use of school libraries. Library Herald, 16 (1-2), 1974, 14-22. INDIA

73. LASSO de la VEGA, J. (1975) El trabajo intelectual: normas; técnicas y ejercicios de documentación [Intellectual work: norms, techniques and documentation exercises] Madrid: Paraninfo, 1975. SPAIN.

74. LONGWORTH, Norman (1977) Teaching 'information' in the secondary school. Computer Education, 25, 1977, 16-18. BRITAIN.

This is an outline of the author's M.Phil. thesis (University of Southampton, 1976) which introduces teaching modules and notes for school courses.

75. MALLEY, I. compiler A catalogue of UK audiovisual media suitable for use in library instruction courses. British Library Information Officer for User Education, Loughborough University of Technology, 1980. BRITAIN.

Lists a range of audiovisual items which cover the use of information sources.

76. MARLAND, M. and HILL, S. eds. Departmental Management London: Heinemann Educational Books, 1981 BRITAIN.

Includes a chapter on library and study skills and one on drawing up a scheme of work for introducing the skills across the school curriculum. THere are also two examples of existing curriculum policies.

77. MENDIATA ALATORRE, A. Métodos de investigación y manual académico. [Investigative methods and academic manual] Mexico: Porrua, 1976. MEXICO.

78. MEULEN, J. van der en SWINK, J. (1973) Van ABC tot Woordenboek. Groningen: Wolters-Noordhoff, 1973. NETHERLANDS.

79. MICHEL, G. Aprende a aprender; guía de autoeducación. [Learn to learn: a guide to self education] Mexico: Trillas, 1975. MEXICO.

80. MINKKINEN, Sirkka A general curricular model for mass media education. Unesco/J.M. Lorca. 1978.

Essentially concerned with the skills for communicating and interpreting information conveyed via the mass media, this work offers aims, objectives and teaching methods for secondary school teachers. Based on media education programmes from 12 countries in Europe.

81. MIRA y LÓPEZ, E. (1967) Cómo estudiar y cómo aprender [How to study and how to learn] Buenos Aires: Kapelusz, 1967 BRAZIL.

82. NOBEL, Agnes et. al. (1979) Barn på universitet: försök med gemensamma barn - och vuxenaktiviteter vid några institutioner [Children at the university : an experiment with joint activities for children and adults in some institutions] Skolöverstyrelsen, Sektionen för läromedelsutveckling, 1979. SWEDEN

Using examples, covers how to use information and how to gather it from sources in the environment outside school.

83. OBI, Dorothy S. (1977) A manual for school librarians on small budgets. Ibadan: Oxford University Press, 1977 NIGERIA

Includes a chapter on teaching children to use the school library, and the approach relates to the Nigerian situation both climatic and cultural.

84. ODENSTAM, Gunnel et. al. (1976) Biblioteket i undervisningen: en arbetsmodell för informationssökning i samarbete elev-lärare - bibliotekarie. [The library as part of the teaching programme: a working model for informational retrieval] Sokolöverstyrelsen, Sektionen för lä romedelsutveckling, 1976.

For pupils, teachers and librarians - with ideas and methods applicable in most countries.

85. OGUNSHEYE, F.A. Editor (1978) Syllabuses for the effective use of books and libraries for primary schools, secondary schools and teacher training colleges. Abadina Media Resource Centre/Department of Library Studies, University of Ibadan, 1978. NIGERIA

Outline syllabuses for school children from primary to secondary levels. The first syllabus has been expanded in more detail to cover each weekly class and the supporting materials

86. OLEA FRANCO, P. Manual de técnicas de investigación documental para la enseñanza media [Manual of techniques for documentary investigation for middle education] Mexico: Esfinge, 1975. MEXICO.

87. PAUK, W. (1971) El arte de aprender: guía para estudiantes secundarios y universitarios. [The art of learning: a guide for secondary school and university students] Buenos Aires: Huemul, 1981. BRAZIL.

88. PLOMP, C.A. en VALK, A.J.J. van der (1977) Het documentatiecentrum [The school library] Velp: Provinciale Biblioth-eekdienst Gelderland, 1977 NETHERLANDS

Instructional techniques for using the school library.

89. PLOMP, C.A. (1978) Leren boeken zoeken [Teaching book search] Kampen: Kok, 1978 NETHERLANDS

Guidelines for teaching school children how to find books.

90. RICHARDSON, Bengt, SJÖQUIST, Siv, TÖRNER, Karin (1979) De vill veta: lär dem leta: et hjälpmedel för att lära elever söka information i bibliotek och ur andra källor. [They want to know: teach them how to search: aids to teach pupils search information in libraries and other sources] Linköping: Fortbildningsavdelingen, Sektor lärmedel, 1979. SWEDEN

A detailed exposition of how to use the school library. Although mostly relevant to Swedish schools, it could be adapted for international usage.

91. SEUME, Ursula et. al. (1975) Unterrichtseinheit Einführung in die Bibliotheksbenutzung für das 5.-10. Schuljahr [An introduction to a teaching unit in the use of school libraries for children aged 11-15.] Berlin: Deutscher Bibliotheksverband, Arbeitsstelle für das Bibliothekswesens, 1975. GERMANY (West)

A good, illustrated introduction to the use of school libraries.

92. STATON, Th. F. Cómo estudiar [How to study] Mexico: Trillas, 1973. MEXICO.

93. Tonbildschau über Schulbibliotheken [Tape-slide programme on school libraries] Bern: Kommission für Jugend- und Volksbibliotheken des Kantons, 1977. GERMANY (West)

This paper suggests how to prepare and use a tape-slide programme for the school library.

94. Unterricht mit der Bibliothek [Teaching by means of the library] Bern: Genossenschaft Schweizer Bibliotheksdienst, 1978. SWITZERLAND

Contains a number of useful diagrams.

95. Unterrichtseinneit Bibliotheksbenutzung: Einführung in die Bibliothek und in die Katalog -benutzung [Instructional unit in library use] Bremen: Stadtbibliothek Bremen, Schulbibliothekarische Arbeitsstelle, 1976. GERMANY (West)

Some good programmes for introducing the library to children.

96. VALK, A.J.J. van der (1976) Leren hanteren [To teach handling] Kampen: Kok, 1976 NETHERLANDS

Instruction in finding information quickly through the use of tables of contents, indexes, illustrations - and in presenting information.

97. VENKATIAH, M. How to make students library conscious. Journal of Indian Education, 2(6), 1977. INDIA

98. WEHMEYER, L.B. (1976) The school librarian as educator. Libraries Unlimited Incorporated, 1976. UNITED STATES OF AMERICA

A useful and practical manual including arguments for the school library's unlimited potential for meeting individual needs of learners.

See also item numbers: 4, 5, 6, 7, 10, 12

5. CREATING INSTRUCTIONAL MATERIALS

5.1 Previous sections of this report have illuminated the skills for handling information in some detail, but at a level sufficiently general to enable application across age groups in widely-differing schooling systems, and in countries with very different information and documentation infrastructures. The creation of materials for use in many or all countries seemed an impossible suggestion at first but eventually it was realised that by removing the obstacles of different pedagogies, institutions, cultures and resources between nations it was possible to discern some areas where materials of international relevance could be recommended for creation. These fall into two main groups :

(i) materials for use with school children

(ii) materials for teachers which will help them develop their own materials and methods in their own local situations

5.2 The ability to handle information, as has been shown, rests upon a set of cognitive skills which must be introduced, learned and practised under the guidance of classroom teachers (who have most contact with school children). Previous thinking on information-handling has tended to concentrate upon the physical ability of the user to locate and retrieve documents from organized collections of material. From an examination of instructional materials from different countries, it is evident that this kind of instruction is directly related to the availability of documents, the way they are organized

and recorded, and where, within a particular institution, they are stored for use. Much of the material collected did not attempt to educate children in the evaluation and use of information, nor how they could begin to define their needs with the precision and terminology required for effective and efficient searching. It was felt that much of the need to show users how to find their way around libraries and documentation centres results from the use of sterotyped methods for recording and arranging material for children : simplification is both possible and desirable, and some suggestions for doing this are included in the proposed guidelines for teachers.

5.3 The creation of audiovisual materials was considered, but with some reservations about the cultural differences which might influence children's interpretation and perceptions, even from graphic or symbolic representations of concepts and ideas. With the emergence of simple, cheap, battery-powered projection and viewing equipment it is possible to suggest the creation of some audiovisual materials, but an international presentation should be used as a model for individual national organizations to adapt and make relevant to their individual, local circumstances.

Audiovisual materials are now relatively inexpensive. Posters are cheap to produce and if well-designed are very effective. Synchronized tape-slide presentations of approximately 10 minutes duration can cost as little as $20 to produce. The equipment needed consists of a tape recorder (cassette players cost from $30), a slide viewer (around $20) or projector (around $40) and a synchroniser ($30). The total cost can be as low as $80. Tapes and slides should be kept cool (60°F) and in a stable humidity.

5.4 Materials for teachers

It must be emphasised that teacher education is a crucial element in the development of information concepts and skills in school children. Unless there is some freedom to choose learning assignments and work independently (through discovery or enquiry methods) children will be unable to practise any newly-learned skills regularly, throughout their school work. The style, attitude and methods of teachers are more influential than the range, nature and quality of materials and support services. If the teacher views his role as that of sole dispenser of knowledge, information handling skills will appear irrelevant and unnecessary. For these reasons, a teaching package for teachers is proposed which could be used by individual teachers or by those who organise their education and training.

5.4.1 The teaching package should contain the following components:

(i) an explanation of the concepts and relevance of information

(ii) a taxonomy of information skills

(iii) a school curriculum plan showing how the skills apply across the disciplines

(iv) samples of materials and methods for teaching and learning information skills

(v) an annotated bibliography of further reading, sources of help and information

The taxonomy of information skills could be supplemented or extended by groups of teachers in different disciplines, so that continuity of the information skills teaching is maintained throughout the school.

Materials and methods for teaching the skills would be best developed by groups of teachers in their individual locations. This will ensure relevance, and an acceptance of local conditions. Some materials currently being used in adult literacy programmes could be adapted for use with younger people.

5.5 Materials for students

5.5.1 Concepts

The survey of information handling materials uncovered very few which dealt specifically with information concepts and skills, but the few identified covered the topic well. Figures 1-3 from item 17 in the bibliography, although designed for use with students aged 15 years they would easily adapt for use with younger children.

The material from this project was the only material identified which used graphic representations of the concepts but another item, number 70 attempted to explore the topic by using everyday services and organizations for a context, for example, the police service. In this project the way in which each organisation gathers and uses information is explored, and teaching notes are included which are based on the experiences of teachers who participated in the trial use of the modules.

One of the major obstacles to teaching the concepts of information must be the lack of definition of 'information' itself. There have been innumerable attempts ot produce a working definition of information; around 40 different definitions of information science have been identified[8]

8 FAIBISOFF, S. and ELY, D. (1974) Information and information needs : paper prepared under the Commissioned Paper Project. Teachers' College, Columbia University, for the Division of Library Programs, United States Office of Education.

FIGURE 1

Everything that we hear taste feel smell and see INFORMS us about the world we live in.

Can you imagine what the world would be like without the information we recieve through each of our senses?

Although information is here, there and everywhere we don't take notice of all of it...

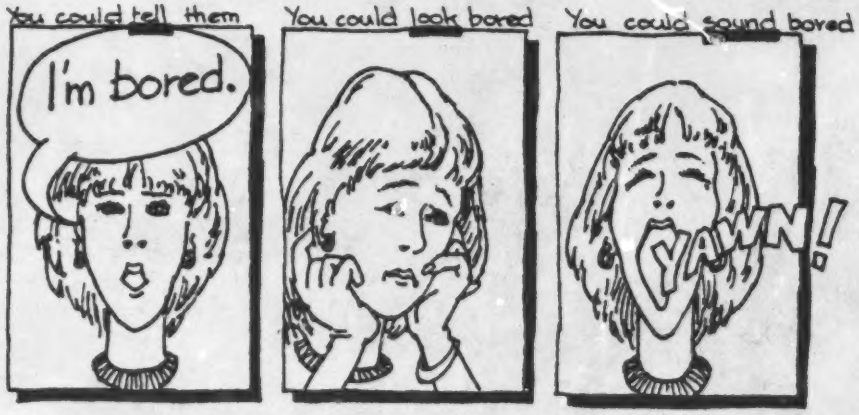
For example, on a notice board outside of the school is painted the name of the school and the name of the headmaster. After the headmaster's name are a number of letters which signify his qualifications. Do you know what they are? If you don't then the headmaster's qualifications are not something you particularly want to know. You might be more interested to find out if you were a parent thinking about sending children to the schoo... If you do... ...enant.

Source: BRAKE, T. (1980) The need to know : teaching the importance of information. British Library Research & Development Department, 1980. (Report no. 5511)

FIGURE 2

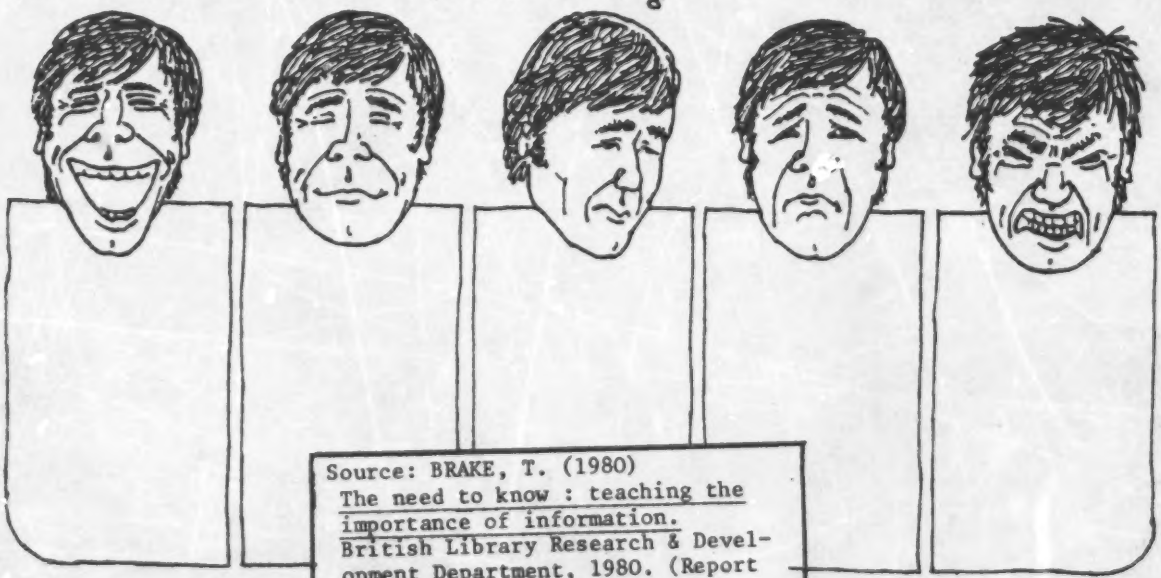
So far we have only talked about the information that we receive through our senses.
What about the information that we give to others?

We give information to others in many different ways.
Think about how you could inform someone that you are BORED:



Can you think of other ways that you could inform someone else that you are BORED?

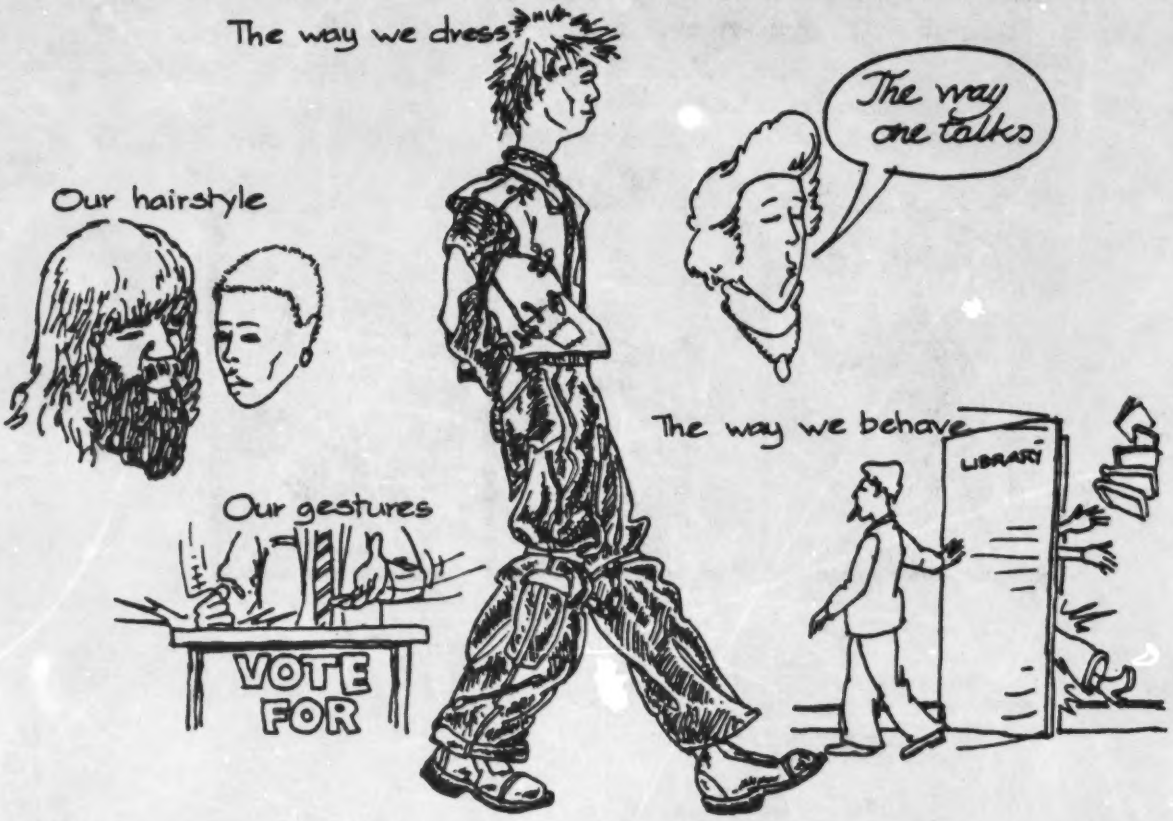
LOOK AT THESE FACES. What information is each face giving you about the mood this person is in?



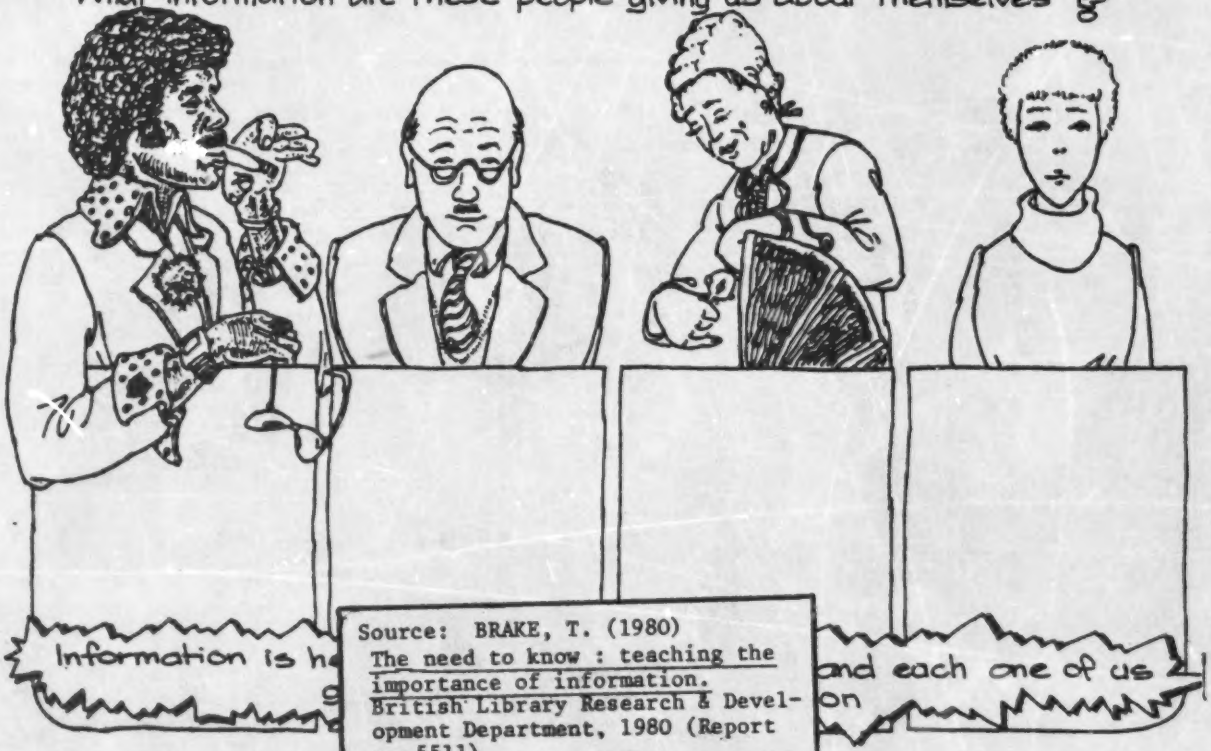
Source: BRAKE, T. (1980) The need to know : teaching the importance of information. British Library Research & Development Department, 1980. (Report no. 5511)

FIGURE 3

Many of the things that we take for granted about ourselves inform other people about the kind of person we are, for example



What information are these people giving us about themselves?



Source: BRAKE, T. (1980) The need to know : teaching the importance of information. British Library Research & Development Department, 1980 (Report no. 5511)

with few common elements between them. The definition used by the Graduate School of Library Science at Drexel University seems to be one of the broadest, and therefore most useful for school children:

> *" ... information is to be interpreted in its broadest sense : facts, data, visual or oral representations which convey meaning or elicit feelings. Thus information includes informational materials, and in all possible formats."*

With such a definition it should be possible to draw upon examples from the immediate environment, irrespective of resource provision in schools, although the need for adequate resources in schools must be strongly emphasised - especially in developing countries.

What might be produced therefore, is a teaching package which consists of a series of questions and some examples (eg those illustrated in figures 1 to 3), for teachers to extend and develop in their own local situations. The questions might usefully be explored by students through observation and discussion drawing upon organisations and institutions with which they are already familiar, for example, extension workers, agricultural development agencies, even the school itself which is a microcosm of information generation, exchange and use.

The questions to be answered about information are:

- what is information?
- where is it found?
- how much is there?

- why is it needed?
- how is it used?
- when is it used?
- who uses it?

This stage would help to place concepts, values and needs for information into the child's personal context and could easily lead on to a consideration of published information sources, the concept of recorded knowledge, authorship and presentation formats (for example, books, television, radio, films, newspapers, people).

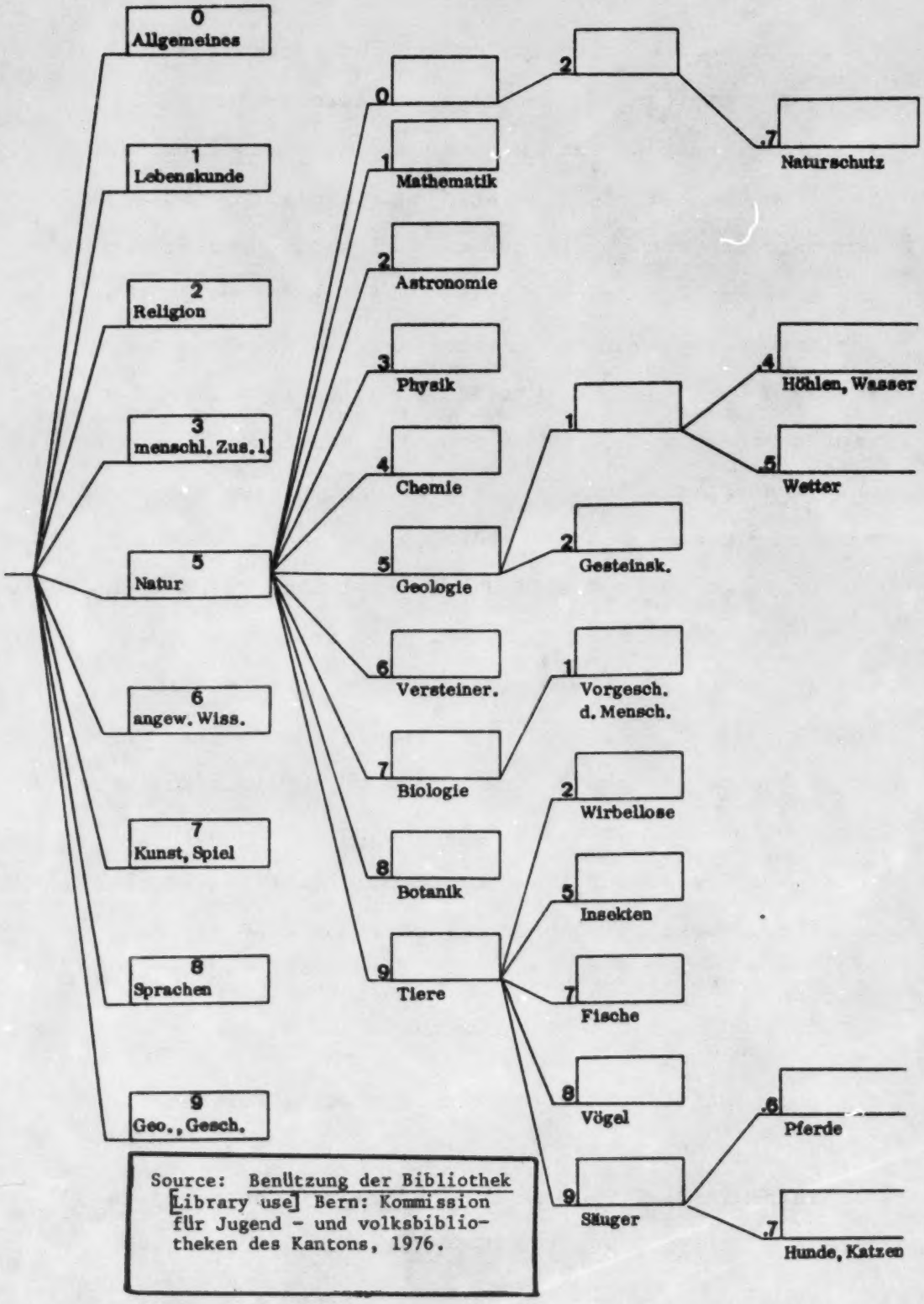
5.5.2 Skills

Information skills have been broadly outlined, within the context of school work, in section 3. Two current research projects (item numbers 27 and 30 in the bibliography) are developing teaching materials and assessing their performance and suitability in schools. These, together with item number 72, are only partially concerned with the skills for finding information from organised collections of recorded knowledge - libraries and documentation centres. This is partly because of a growing feeling that much of what has been included in library education programmes could be reduced if only libraries were simplified and better guided (item 37 in the bibliography raises a number of important points on this theme). As an example, figure 4 shows a classification scheme and how one class is subdivided. This could be made into a floor plan and pinned up on a wall or bookcase, thus removing the need for children to

Baum - Diagramm : Entstehung der DK - Ziffern

FIGURE 4

Setze in die leeren Felder die richtigen DK - Ziffern ein !



Source: Benützung der Bibliothek [Library use] Bern: Kommission für Jugend - und volksbibliotheken des Kantons, 1976.

be taught, and have to memorise, the elements of this particular classification scheme.

But the concept of classification is important. The mental process of classifying knowledge serves a dual purpose : storage and retrieval of information from the brain. Many library education programmes introduce this concept but it is treated superficially, and as a means to the end of library classification instead of the reverse. Of course, it is useful to be aware that 'things go together' but not always the same things in the same way. A library classification is a schema which represents only one way of grouping knowledge : some of the greatest research and innovation has developed from a person being able to make totally new and different links. Prescriptive conceptual linking can therefore be a major barrier to progress and change. Understanding links between concepts, ideas and knowledge is a process of thinking and the methods employed by De Bono (item number 20 in the bibliography) are worthy of application. Any group of objects or ideas known to children can be used as tools for developing the concept of classification: animals, families, toys, schoolroom objects, clothing or food. There will be different desirable groupings for different purposes and for different individuals.

This concept of classification is crucial to the first stage noted in section 3: defining the topic and the need for information. Thought is a process which requires language facility and the definition of a topic set by a

teacher requires an analytical use of thought applied to the language of the topic. The terms may represent different concepts to individual children, whose own mental schema must be explored in order to help their understanding of the terms leading to their identification of what they should find out about it. Linking concepts together provides a framework for deciding where and how to look for information.

Knowing which sources of information are available will depend upon the teacher's own knowledge of sources, although students will be able to identify a range of them from a reflection upon the first stage in this section. Each kind of information source will require slightly different approaches and search strategies. Libraries, for example, have a predetermined order and sequence of materials which require a specific strategy for gaining access, whilst people (as information sources) require a clear statement of the enquiry but are able to access their own stores of knowledge from many different angles which makes retrieval much easier. These differences in approach need to be pointed out as do the different prerequisites of the enquirer. Being able to use a library demands the skills of literacy and certain prerequisite skills : understanding alphabetical and numerical order (for use with catalogues, book indexes, shelf arrangements), reading skills (not only being able to read words but an ability to apply different reading strategies such as scanning and skimming, and with a variable pace), and comprehension (what the material which has been read actually means and

where it relates to existing knowledge and the assignment being carried out). Access to a computerised information source requires similar skills but additionally, some manual skills for using a keyboard. A computer system has other inherent properties, for example, a precise and fixed thesaurus of terms which reduces the ability to browse or make accidental discoveries.

The fine details of the different approaches need not be over emphasised since each source varies according to who or where it is and how it has developed, but the basic elements which are common to each kind of source should be explored.

As information is found it should be evaluated for its suitability and relevance to the assignment. This is an important and often neglected skill, and some would say it was impossible to teach. De Bono (item number 20 in the bibliography) has demonstrated that low-ability students have a potential for critical analytical thinking which is often not explored, and offers techniques for doing this. Evaluation of information requires that the student should ask whether or not it is relevant and appropriate to his assignment. Attempting to assess the accuracy and authority of information is problematic at school student level because it is often possible only when one has the experience and maturity of adulthood with its concomitant formation of attitudes, beliefs, values and opinions. To an extent the assessment of

'good' or 'bad' information is entirely subjective for it is often the action resulting from the application of information that determines the true quality. However, it is possible to discern some clues at a basic level and these could be noted by students (for example, is this person an 'expert' in his field? or has this author any relevant qualifications for writing on this topic?). An awareness of bias could be encouraged so that 'official' and 'unofficial' sources of information could be balanced.

Note-making and presentation are a mixture of manual and cognitive skills. Tidy, well-arranged notes lead to speedy and easy retrieval of information and a well-organised presentation shows evidence of understanding both of the task or assignment and the nature of the audience for whom the presentation is intended. There are many manuals which include suggestions and prescriptions for taking notes but the best method is the one which works well for the individual student. The teacher's task is perhaps to explore many methods and help students assess their personal value. The way a student makes notes, and their contents, reflect the way he thinks about his topic, but constant re-appraisal of stage 1 in this section should ensure the recording of relevant information, irrespective of how it is physically recorded on paper or tape or in a pictorial format.

5.6 Methods

The package for teachers outlined in 5.4 would facilitate

the development of methods for teaching information concepts and skills because, having themselves gained the necessary knowledge and skills teachers would be able to draw upon their pedagogical expertise to design materials which were both relevant and appropriate to their locations, students and resources . However, there are several areas where centrally-produced materials might be valuable aids to teachers when beginning to introduce information concepts and skills. An assumption has been made about the availability of simple audiovisual equipment which is now so cheap and easy to maintain that few countries would be denied access to it : slide and filmstrip viewers/projectors, audio cassette players/ recorders and overhead projectors.

Emphasis for teaching must, however, rest upon the participation of students through personal observation, experimentation, research and discussion. Children bring knowledge and skills with them when they commence school and this must be used by teachers in any information skills instruction. A useful guide is item number 63 in the bibliography, which uses a simple but effective technique for classroom discussions.

The suggested materials would be in three main formats:

(i) slides (possibly with synchronised audio tape commentaries)

(ii) overhead projector transparencies

(iii) print (including posters, charts, and textual material)

and would fall within three broad categories:

(i) information concepts

(ii) information skills

(iii) information sources

The last item would be subdivided into:

(a) information systems

(b) information contents

so that the procedures for accessing the kinds of sources would be followed by details on the usage of particular kinds of material contained within them (for example, books, charts, photographs, slides).

5.7 Production

Since it is difficult to produce anything which is entirely culture or value free, the recommendation is that each country should assemble a representative panel of teachers and librarians in order to decide the detailed contents, formats and methods using the points made throughout this report as a guide. Teachers would bring pedagogical expertise to the proceedings and librarians would bring their knowledge of information in all its manifestations plus their skills in handling it. Both would also bring knowledge and experience of information users.

The panel, using the guidelines outlined, would be able to relate the suggestions to their local situations and decide upon the most appropriate methods and materials for their students and schools. Representatives from

the institutions which educate and train teachers, librarians and other information workers should also be included because the teaching of information skills must, if it is to be effective, be a part of normal, everyday classroom teaching and learning. Thus, all teachers, whatever their subject, must make adjustments to their teaching styles and methods. If a skill is to be truly learned it must be introduced and regularly practised : only teachers can create opportunities for this through the range and nature of assignments set for students. The inculcation of teaching strategies is the responsibility of those who educate and train them.

Librarians, on the other hand, help to meet demands for information by providing sources of recorded knowledge, arranged systematically for (usually) independent access by those who require them. Their methods for retrieving information involve a similar process to that described in section 3, although this is often carried out unconsciously, without articulation.

The document produced by the Schools Council (item number 21 in the bibliography) contains a list of questions that a student (or any other information searcher) might ask himself as the search progresses. This not only describes all the steps involved but also could be used as a basis for any national panel's work. The main questions in each section are reproduced in figure 5, but the full listing, with its notes of explanation, would be needed.

FIGURE 5 THE INFORMATION SKILLS CURRICULUM

1. What do I need to do?
2. Where could I go?
3. How do I find the information?
4. Which items shall I use?
5. How shall I use them?
6. What should I make a record of?
7. Have I got the information I need?
8. How should I arrange and present my findings?
9. What have I learned?
10. How can I improve this process next time?

Source : Schools Council Curriculum Bulletin 9, Information skills in the secondary curriculum, edited by Michael Marland (Methuen Educational, 1981). Reproduced with permission.

Sets of slides or overhead projector transparencies might be produced on lines similar to the examples given in figures 1-3. The panel would draw up sets of notes for teachers and suggest exercises, within normal subject teaching, for teachers to set and monitor. Or, a series of synchronised slide-tape presentations could be made at the national level with similar examples of exercises for teachers to adapt and use in their classrooms. The advantages of an audiovisual approach are many, but the most significant is that students remember information better and for longer when making a personal response to an audiovisual stimulus, guided and supplemented by the teacher's personal skills and knowledge of individual pupils.

Similar recommendations could be made for dealing with information skills, although the discussion approach involving personal reflection upon existing skills is favoured. Slides or transparencies could be made for use with large groups of students before discussion in smaller groups. The slides might carry the questions, or the questions enhanced by examples of how to answer them using available sources in or near the school, perhaps by means of cartoons.

Information systems present a greater problem because of the differences in resource provision, not only between countries but also between different geographical areas within each country. The broad range of kinds of sources could be dealt with at the national level (for example,

people, museums, libraries) but since not all will be within the reach of school students there would need to be amendments within certain localities. A national panel might consider a slide-tape guide to the organisation and arrangement of a school library which covered general principles of arrangement and guiding, leaving spaces for each school to insert its own specific details.

Using individual items is not so differentiated. The skills for using a book will not vary between schools nor will the skills of using pictures or viewing educational television programmes. Some relevant material exists (see items 28, & 38 in the bibliography) which could be structured and presented in whatever format seems most appropriate to individual schools. Printed (textual or diagrammatic) summaries are always useful and should be provided so that students have a reminder of anything taught to which they can refer.

5.8 Producers

A central teaching package for teachers would be best produced by a specialist with expertise in the fields of information skills, teaching methods and audiovisual media. For school students, similar expertise would be required, but this could be at the level of a consultancy, either an individual, an organization or a small group of people whose collective expertise could be drawn upon when required. The person appointed to design the teacher's programme might be asked to develop the ideas

and suggestions in this document in much greater detail, producing a planning document for national panels to adopt.

Most nations have government or broadcasting agencies with production equipment and expertise readily available; teachers' and librarians' colleges also, but to a more limited extent. There are also commercial companies who specialise in the production of teaching materials, publishers, distance-learning colleges, universities of the air and private individuals or groups.

A number of research and charitable bodies might be willing to provide funds. The Nuffield and Gulbenkian Foundations, for example, have an expressed interest in the development of innovations in teaching methods and in the raising of awareness of citizens towards education and participation in civic affairs. There are also some international organisations (Food and Agriculture Organization, for example) which have sponsored the development of educational programmes designed to encourage the dissemination and absorption of development information. Such organisations might be willing to co-operate on ventures which aim to develop information concepts and skills for the earliest age groups.

5.9 A workshop model for teacher training

Aims

1. To introduce the concept of information and the skills required for its handling
2. To explore methods for creating relevant instructional materials
3. To devise pedagogical strategies for including such instruction into existing curricula

Objectives

By the end of the workshops, participants should be able to:-

1. Understand the concept of information and its relationship to school education
2. Apply information-handling skills to a wide range of learning tasks in school
3. Create instructional materials that can be used to develop information skills in school children

Elements and methods

Elements	Methods
1. *the concepts and relevance of information*	*(see section 5.5, 5.6 and the Bibliography)* The items by Brake, Longworth and Faibisoff provide examples which can be used to lead discussion. The Schools Council document and the manual by Gibbs should be read in advance. Both provide rationales for information skills.
2. *a taxonomy or matrix of information skills*	The items by Dean, Brake, Winkworth, Irving and the Schools Council provide lists of relevant skills. Participants should add any others relevant to their own schools (e.g. oral communication skills)
3. *methods for teaching*	The manual by Gibbs and the Schools Council document provide useful methods for teaching. Small group sharing of experiences of study habits and problems is the most effective approach, supplemented by handouts on specific techniques (e.g. note-making techniques) and practical exercises.
4. *the creation of instructional materials*	An educational technologist would demonstrate the techniques and justifications for producing audio visual teaching aids, and several approaches to instructional design and evaluation.
5. *a school curriculum policy for introducing information skills*	Models are available in the item edited by Marland and Hill. Teachers should apply these to their own schools., modifying as required to suit local conditions.

Practice is an important factor; there must be adequate time for participants to apply their learning to classroom

work. After receiving instruction on the creation of materials, participants should, preferably as a group exercise, produce at least one short item so that the possibilities and constraints can be studied at first hand.

Duration

The outline can be used for short or long courses. Where there is very little time available, the elements can be covered in outline in one or two sessions; where there is more time, each element can be allocated one or more sessions. The outline could also be adapted to distance learning, offered as a self-study package for teachers in remote locations. As an in-service programme, the outline could be covered in a block of consecutive sessions or in weekly or monthly units over a longer period of time, intercolated with classroom-based practical exercises.

Instructors and resources

Where possible, expertise is desirable in study and information skills, librarianship, educational technology and audiovisual production. Some of the items noted in each section of the bibliography should also be provided to stimulate the participants' thought and work.

6. SUMMARY AND CONCLUSIONS

6.1 The purpose of this work was to emphasise the importance of information concepts and skills and to survey existing materials and research which attempt to convey them to school children. Through the survey of many countries, an attempt was made to identify relevant activity and material, but very little was found within the specific limitations of the topic.

6.2 International and schooling constraints were noted and these affected the choice of materials for inclusion in the bibliography. Only those items which would be internationally relevant have been included but a number of bibliographies and literature reviews which may yield locally relevant items have been included.

6.3 Areas have been identified where the creation of materials might be feasible, and suggestions on their contents, methods and formats were made. Audiovisual material may be especially useful, not only because of its facility for use with large groups or by individuals, but also because of the participation and responsiveness it encourages in the learner.

6.4 Two basic packages have been suggested. One for teachers, to help them understand information concepts and skills and to aid the creation of student material at the local level, and one (or rather a series of packages/programmes) for students which would be produced after the deliberations of a specially created panel of teachers, librarians, and their educators or trainers. This panel would guide the production of materials and offer expertise to the producers.

6.5 The student programmes would cover three broad areas of knowledge and skills:

(i) concepts
(ii) skills
(iii) sources:
  (a) information systems
  (b) information contents

and would utilise three main formats:

(i) slides and synchronised slide-tape presentations (including filmstrips)
(ii) overhead projector transparencies
(iii) printed material, both graphic and textual

The formats chosen represent equipment which is both cheap and reasonably accessible everywhere, with power supplied from mains electricity or batteries.

6.6 The range and nature of the proposed materials have been outlined but it has been suggested that a consultant is engaged to develop the ideas and suggestions for the teachers' package presented here. The use of consultants in the production of student programmes has also been recommended, but that consultancy expertise should be tapped by groups of teachers in their own localities so that any materials produced are directly related to local circumstances.

6.7 It should be realised that some initial and in-service education for teachers and librarians will be required and a workshop model that can be used at either level has been produced (5.9).

6.8 Finally, this work has been hampered by the difficulty of finding acceptable definitions of "information'. The term is widely used but with widely differing connotations. This had also been a major obstacle in many of the programmes currently in use which are thought to be designed to teach people how to handle information. There appears to be no single theory of information and therefore no single delineation of the material and manual skills for its manipulation. In addressing this work largely to this problem, it is hoped that some useful progress has been made upon which others may build in the future.

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A N N E X

COUNTRIES AND TERRITORIES CONTACTED

This list is not comprehensive, nor were replies received from all the people and organizations contacted by working group members.

Australia
Austria

Bahamas
Bangladesh
Barbados
Brazil
Burma

Canada
Colombia
Cyprus
Czechoslovakia

Denmark

Egypt

Fiji
Finland
France

German Democratic Republic
Germany, Federal Republic of
Ghana

Hungary

Iceland
India
Israel

Jamaica
Japan
Jordan

Kenya
Kuwait

Liberia

Malaysia
Mexico

Nepal
Netherlands
New Zealand
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